If roots must be shipped soon after harvest, the time required for skin set may be shortened somewhat by proper curing at standard conditions followed by several weeks at proper storage temperatures but at less than 85 percent relative humidity with good air ventilation (as much as 30 to 50 cubic feet of ventilation per day per bushel may be required in this circumstance). This treatment may allow roots to be shipped sooner but will result in increased weight loss, so it is important to move this product quickly to market. For longer storage periods, follow the curing period with normal storage conditions—55°F (13°C), 85–90 percent relative humidity, and adequate ventilation.

PROBLEMS ASSOCIATED WITH IMPROPER CURING:

Inadequate and excessive curing can shorten shelf life, increase sprouting during storage, and result in excessive weight loss. Normal weight loss should not exceed 5 to 8 percent of the freshly harvested weight.

Improper ventilation during curing can result in an extremely low oxygen/high carbon dioxide environment. Exposure to this environment for short periods has been shown to reduce the effectiveness of curing, shorten storage life, and alter the taste of the sweetpotatoes, but this problem is unlikely to occur in a properly operated modern facility.

Curing at improper temperatures or humidity can reduce quality during storage. Research has shown that curing sweetpotatoes at temperatures below 75°F (24°C) increases weight loss and decreases storage life. Low humidity also results in inadequate healing of wounds.

Curing that continues for too long can result in widespread sprouting (Figure 15). It is not unusual to see short (less than one-fourth inch) sprout buds on a few roots toward the end of curing; however, widespread sprouting results in rapid weight loss. The best way to minimize weight loss from overcuring is not to exceed the recommended three to five days of curing and to reduce the temperature to 55 to 60°F (13°C) as quickly as possible. Maintaining the correct relative humidity (85 to 90 percent) during storage is also critical.

Storing for Quality

The next step in the production of quality sweetpotatoes is storage in the proper environment. The primary goal of storage is to maintain root quality and ensure an adequate supply throughout the year by minimizing both physiological disorders and disease development. Current experience shows that high-quality roots that are properly cured and held, undisturbed, under proper storage conditions—55°F (13°C), 85 to 90 percent relative humidity, with adequate ventilation—remain marketable for as long as 13 months.

These storage conditions were first determined in the 1920s with cultivars grown at that time, and recent research has shown that these conditions are still valid for modern commercial cultivars. It is important to maintain the temperature as close as possible to 55°F (13°C). Minor fluctuations of three or four degrees are expected, but avoid fluctuations of more than five degrees. Fluctuations can occur when roots are stored in common storage or in a room without temperature regulation. Fluctuations of more than five degrees will lead to premature breakdown of the sweetpotato and excessive weight loss.

Higher relative humidity (greater than 85 percent) would be entirely suitable for sweetpotato storage. However, from a practical standpoint, very high humidity (90 to 95 percent) is difficult to maintain consistently and to measure accurately. Additionally, very high humidity will cause condensation to form on the building walls or roof, causing maintenance problems and the wetting of bins and roots, which promotes decay. Improper room insulation can also contribute to condensation problems.

PROBLEMS ASSOCIATED WITH IMPROPER STORAGE CONDITIONS:

Improper storage conditions can increase the development of physiological disorders and diseases. Physiological disorders are the result of stresses related to excessive light, heat, cold, and moisture, or the mix of surrounding gases such as oxygen, carbon dioxide, and various pollutants. Some disorders can be caused by mechanical damage, and all are abiotic in origin (not caused by disease organisms) and cannot be controlled by postharvest pesticides. However, many postharvest disorders compromise the sweetpotato's natural defenses, which in turn increases susceptibility to infectious postharvest diseases. In some cases, physiological disorders may even mimic infectious diseases. Common physiological problems resulting from improper storage conditions include excessive dry matter loss, sprouting, pithiness, hardcore, chilling injury, and moisture loss (Figures 9 through 11).

Dry matter loss and pithiness. Sweetpotatoes lose dry matter through natural respiration. Respiration is a chemical process necessary for all living tissue whereby starches and sugars (dry matter) are oxidized to carbon dioxide and water vapor with the liberation of heat. The heat generated by an individual sweetpotato is negligible, but the combined output of thousands of bushels in a storage facility can raise the temperature of sweetpotatoes one-fourth to one-third degree per day. This heat must be continually removed from